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ABSTRACT

Advances in educational technology and its increasing availability in K-12 schools make it incumbent upon colleges of education to look critically at how technology is integrated into teacher preparation programs. In seeking to prepare teachers for the next century, college faculty are increasingly being expected to utilize and model the use of technology; to facilitate its use by their students; and to integrate technology into instruction. Unfortunately, the literature reveals that technology is not systematically integrated into many preparation programs and that the lack of equipment, training, and time often limit opportunities for both faculty and students. This article reports the results of a faculty self-study at Louisiana Tech University regarding: (1) faculty use of technology in planning and instruction; (2) required student use; (3) perceived obstacles to increased use; and (4) faculty interest in professional development in technology. The results have been used to develop a strategic plan to increase faculty use of technology within the college, including external grant development, allocation of additional funds and staff, and faculty collaboration to increase the use of technology instruction. (Contains 17 references.) (Author/ND)

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Integrating Faculty Use of Technology in Teaching and Teacher Education

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Abstract

Advances in educational technology and its increasing availability in k-12 schools make it incumbent upon colleges of education to look critically at how technology is integrated into teacher preparation programs. In seeking to prepare teachers for the next century, college faculty are increasingly being expected to utilize and model the use of technology; to facilitate its use by their students; and to integrate technology into instruction.

Unfortunately, the literature reveals that technology is not systematically integrated into many preparation programs and that the lack of equipment, training, and time often limit opportunities for both faculty and students.

This article reports the results of a college wide faculty self study regarding a) faculty use of technology in planning and instruction, b) required student use, c) perceived obstacles to increased use, and d) faculty interest in professional development in technology. The results have been used to develop a strategic plan to increase faculty use of technology within our college including external grant development, allocation of additional funds and staff, and faculty collaboration to increase the use of technology in instruction. Others who would wish to improve the instructional use of technology in their setting might consider this model for systematic improvement.

Integrating Faculty Use of Technology in Teaching and Teacher Education

With the continuing advances in educational technology and the increasing availability of technology to both universities and the k-12 school setting, it is incumbent upon colleges of education to look critically at how technology is integrated into college teaching and teacher education programs. Technology is becoming a key characteristic in all levels of education and both faculty and students are increasingly expected to function within an environment generated by the Information Age. In addition, there is a growing expectation held by administrators and the general public that today's beginning teachers will be technologically literate and able to integrate technology into their instruction (Kortecamp & Croninger, 1994). The preparation of faculty and prospective teachers in the use of technology has become and will continue to be a key issue in education (Ferrante, Hayman, Carlson, & Phillips,1988).

The use of available and emerging technology by teachers to improve instruction is of particular interest as our nation moves toward the next century and the implementation of GOALS 2000. This is of specific importance in addressing Goal 4 -- The Nation's teaching force will have access to programs for the continued improvement of their professional skills and the opportunity to acquire the knowledge and skills needed to insure and prepare all American students for the next century; and Goal 6 -- Every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibility of citizenship (GOALS 2000: Educate America Act, 1994). Hill (1992) maintains that literacy can no longer be limited to one's abilities in the three R's, but rather should include the communication of ideas, as well as the abilities to deal with the complex ideas and skills represented in the media.

In order for prospective and practicing teachers to utilize available technology in their instruction, it is important for them to have both knowledge of and access to such technology in their teacher preparation courses. Collis (1988) notes that many technology classes are reduced to having students learn about technology, including names, dates and technological vocabulary, but that practical application of technology may be missing in many programs. Students may be being taught about technology while at the same time having few opportunities to practice using these necessary skills. The Office of Technological Assessment has suggested a more appropriate balance between technological demonstration and practice (Scrogan, 1989). Although there may be noticeable variance between school districts with regard to the local availability of technology (Flaitz, 1994), it is nonetheless important for prospective and practicing teachers to utilize technology in their teaching. Failure to integrate modern and evolving technology into teacher education programs can result in classrooms where the use of educational technology will have little meaning in the lives of students. Moreover, faculty members serve as role models for prospective teachers and their use of and attitudes toward educational technology can have a significant impact on future teachers' implementation of technology in instruction (Huang, 1994). D'Ignazio (1990) maintains that changing our perspective on the use of technology can "turn the classroom into a vehicle that teachers and students can use to travel the real electronic highways in order to experience new knowledge for themselves" (p. 21). In light of these factors, having content and methods instructors who model the use of technology, integrate technology into their instruction, and require their students to do the same is vital if future educators are to be prepared to integrate technology into instruction upon employment.

Obstacles to the Use of Technology

Despite the apparent awareness of the importance of technology in teaching and the efforts of faculty at schools of education to provide instruction in technology, many education majors who become teachers report that they "do not feel that they are prepared to integrate technology into their instruction when they are employed in schools" (Wetzel, 1993, p.336). The editors of Electronic Learning (1991) surveyed the 15 largest schools of education and concluded that "...technology does not permeate a student's typical preservice education experience, and that is a major impediment to technology use once they become teachers." (p.21) These data can be discouraging to those of us who struggle to model and integrate technology into our instruction while at the same time providing us with the opportunity to reflect upon the nature and scope of our practice.

A review of the literature on professors' use of technology in instruction indicates that many do not use it in any systematic or curricular way, if at all. Although many may use computers for word processing, much smaller percentages indicate required usage of technology by students or the development of technological applications for their courses (Wetzel, 1993). Many faculty hold the position that an initial technology course is vital for students while some other programs have been successful in integrating technology throughout their teacher education coursework (Parker, 1993). Some of the major reasons cited in the literature for not more fully utilizing technology in instruction include (a) lack of awareness of the instructional potential (Staman, 1990); (b) lack of enough technology in the schools for it to make a difference (Roberts & Ferris, 1993); (c) lack of training and personal expertise (Jacobson & Weller, 1988); and (d) view of technology as a time eater rather than a time saver until it has been mastered (Rossberg & Bitter, 1989). Boettcher (1995) contends that the core principles of

access to all types of technology and support (including having knowledgeable people available and willing to answer questions) are critical in overcoming the obstacles to using technology that are encountered by both faculty and students. Nevertheless, the preparation of teachers for the next century who feel confident in the use of technology requires that college of education faculty increase their use of technology, provide their students with opportunities to use technology, and that faculty model the use of technology in instruction.

Beginning in the summer and fall of 1995, a small group of faculty within our college of education began informal discussions regarding the use of technology by our faculty in our teacher education classes. Subsequent to these discussions, our dean appointed a college wide technology committee of faculty and staff to review access, use and availability of technology within our college and to develop a strategic plan to increase the use of technology by faculty in their instruction. One of the first actions of this committee was to collect and analyze data related to the faculty's use and integration of technology in teaching and teacher education classes and to determine perceived obstacles to the increased use of technology in teaching. It was hoped that the results of this study would be used in the development of a strategic plan to increase faculty use and integration of technology. This article reports the findings of this study and the subsequent developments within our college to increase the use of technology by our faculty and students.

Method

The survey population for this study consisted of the faculty (n=42) in the College of Education at Louisiana Tech University. The college has the largest enrollment (over 2000 students) on the Louisiana Tech campus and offers degrees

from the baccalaureate to the doctorate. At the time of the study, faculty offices had IBM, IBM compatible or Macintoch computers and online connections via IBM mainframe terminals or PC compatible emulator access. The college computer lab had both IBM and Macintosh computers as well as software. The computer lab did not have Internet connectivity.

The survey was developed by the committee to obtain baseline data as to our present use as well as suggestions for and the obstacles to increased use of technology in our classes and throughout the college. Faculty were asked to respond to three question sets with regard to their intended use of technology in no classes, one class, most classes, or all classes during the 1995-96 academic year. In the fourth and fifth question sets, faculty were asked to select their level of interest in technology workshops to increase the use of technology in teaching and to identify the perceived obstacles which hindered faculty use of technology. The sixth question set consisted of open ended questions addressing faculty use of, interest in, and obstacles to the use of technology in teaching. Percentages, frequency distributions, and content analysis were used to analyze the data. Thirty-one of the faculty (74%) responded to the survey.

Analysis

Question Set One

The first question set addressed faculty use of technology in preparation for class. Analysis of the data revealed that a majority of the respondents reported using wordprocessing (87%) and online searches (61%) in preparation for most or all of their classes. Smaller percentages reported using spreadsheets (39%), databases (19%) and Internet or E-mail (19%).

Question Set Two

The second question set addressed faculty demonstration and use of technology in their teaching. A majority of the respondents reported using computed generated materials (68%) in most or all of their classes. Smaller percentages reported using instructional software (45%) and the college computer lab (26%). No faculty reported using or demonstrating the Internet or E-mail in their classes.

Question Set Three

The third question set addressed faculty members' technology requirements of students in their classes. A majority of the respondents reported that they required students to present computed generated materials (65%) in most or all of their classes. Smaller percentages reported the required student use of instructional software (26%) and the college computer lab (32%). No faculty reported the required student use of the Internet or E-mail in their classes.

Question Set Four

The fourth question set addressed faculty interest in future workshops to increase the use of technology in our classes and assist in faculty development. Respondents were asked to indicate any or all of five proposed workshops in which they would like to participate. A majority of respondents indicted a desire to participate in all workshops. Results of this question set are presented in table 1.

Question Set Five

The fifth question set addressed perceived obstacles which hinder faculty use of technology. Faculty were asked to respond to ten obstacles identified in the literature review. Results of this question set are presented in table 2.

Table 1

Faculty Interest in Development Workshops

Using Multimedia Tools for Teaching	84%
Introduction to CD-ROM Resources	90%
Creating PowerPoint Presentations	77%
Introduction to Laser Discs	58%
Using Telecommunications and E-Mail for Teaching and Research	84%

Note. n=31

Table 2

Perceived Obstacles to Increased Use of Technology

Lack of time	25%
Lack of software	52%
Lack of hardware	58%
Lack of keyboarding skills	13%
Lack of knowledge of available technology resources	29%
Availability of computer lab	23%
Availability of computer lab worker	45%
Using technology is frustrating to me	13%
Changes are too fast to keep current	13%
Do not think technology will enhance my subject area	16%

Note. n=31

Question Set Six

The sixth question set consisted of open-ended responses to questions regarding faculty use of, interest in, and obstacles to the use of technology in teaching. Content analysis of the data revealed that there was a wide disparity among faculty with regard to the types of statistical and wordprocessing programs available and in use. Several faculty suggested that an effort be made to coordinate programs within the college and that program upgrades be consistent within each department. Faculty again expressed interest in developmental workshops to increase productivity and use of technology in teaching. Respondents consistently indicated that regular upgrades in both hardware and software and specific staff development activities were essential to increasing faculty use of technology in teaching. The upgrading of the college computer lab and the increased availability of support personnel were also cited as improvements which should be made.

Use of Results in Strategic Planning

The second component of this research effort was to use the results in meaningful ways to support the increased use of technology and to develop a college-wide strategic plan. This would involve collaborative efforts between faculty, staff, and administrators to increase financial support and provide opportunities for faculty development. The survey results indicated that the faculty had a high degree of willingness to increase students' use of technology as a productivity tool in improving instruction. Although many faculty members reported the use of some aspects of technology in their course preparation and teaching, many more appeared to be willing to increase their use of technology in preparation and in teaching provided that upgraded equipment, support personnel, and training were available. The committee developed a college-wide strategic plan designed to

allow us to (a) acquire additional software and hardware, (b) complete the networking of faculty and lab computers, (c) increase the availability of our computer lab, (e) provide additional support personnel, (e) increase available technology training for faculty, and (f) increase faculty awareness of the instructional uses of technology. Since the time of the study, the following aspects of our strategic plan have been implemented:

Acquiring Additional Hardware and Software

As part of our strategic plan, several faculty members have worked collaborative to write and receive funding for two significant grants. One grant from Microsoft Corporation has been funded at $42,000 for the 1996-97 school year to acquire additional instructional and productivity software, as well as interactiveCD-ROMs for use by faculty and students in the computer lab. The acquisition of site licences has ensured that this software and appropriate upgrades will also be available for use in faculty offices. A second grant of $99,000 has been funded by the Louisiana Education Quality Support Fund (LEQSF) which has allowed us to purchase 24 new PowerMacs, additional file servers, and other much needed hardware.

Complete the Networking of Faculty and Lab Computers

The LEQSF grant will also provide funds for the full networking of our lab so that our students and faculty can have improved Internet access. In addition, our dean, with the support of the faculty, has been able to secure priority I funding in excess of $40,000 from the university for the complete fibreoptic connection and upgrade of our building, including faculty offices and classrooms.

Increase the Availability of the Computer Lab and Support Personnel

Our lab has regularly been open from 8-5 Monday through Friday in conjunction with our college media center. Respondents to the survey regularly cited the need to have knowledgeable staff or student workers in the lab and to increase the hours of operation. Although this continues to be a concern, the college has increased the lab hours to include at least two evenings a week and graduate students who have experience with technology are being recruited to work in the lab. Discussions regarding the dedication of some graduate fellowships for students who work in the lab and the eventual creation of a lab director staff position are ongoing.

Increase Faculty Technology Training and Awareness

One of the most encouraging results of this work has been the development of Technology Seminars and hands-on training workshops for our faculty and students. Since the fall of 1995, the college has provided six seminars and workshops for faculty to familiarize them with the technology available in the college. Over 70% of our faculty have participated in at least one seminar. Seminar topics have included the instructional uses of CD-ROMs and other multimedia tools, PowerPoint presentations, videodiscs, e-mail/telecommunications, and internet access. In addition, many of our faculty have completed university wide workshops on electronic mail, listservs, USEnet discussion groups, telnet, FTP, gopher, and WWW through the Office of Professional Development.

Perhaps the most promising result of these endeavors has been the realization by our faculty that many of our colleagues have special knowledge of various aspects of technology and that we can learn much from each other. Small groups of faculty now work collaborative to share knowledge regarding the use of technology in preparation and instruction. There is a newfound sense of collegiality

and a rekindled urgency to ensure that our students are "technologically literate". This can best be depicted in the words of one of our senior faculty members: "I have discovered that computers and technology are important. I don't want my students to end up like me; 52 years old and having to struggle to learn something new. This is something I want them to learn about now and be able to use all their lives". L. Wilkenson (personal communication, April 23, 1996)

Since the beginning of this study, we have recorded an increased number of faculty bringing their classes to the computer lab and an increase in student use of the lab. Faculty also report to committee members that they have increased experiences for their students in telecommunications, list servs, chat groups, online searches, and use of the Internet. In addition, two research projects bringing together university students and students in the public schools through the use of technology have been developed. With the new equipment and upgrades in support, we expect this trend to continue.

Conclusion

The purpose of this study was to provide information to improve the integration of technology in teaching and learning in our college. The results of this study have given us insight into improvements to be made in our college regarding the availability and use of technology in instruction and teacher preparation. The results have been used to develop and implement a strategic plan to increase the use of technology in our college as we work to prepare technologically literate teachers. Although this is an ongoing work in progress and success in some areas has not been as fast as some would wish, the changes that have occurred since the fall of 1995 are encouraging. The experience of working together toward a common goal has provided us with opportunities to grow professionally as well as to provide a better learning experience and environment for our students. Others who would

wish to increase the use of technology in instruction in their setting may wish to consider developing a similar study to begin the planning process for systematic improvement.

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